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| 10/728,573 | 12/05/2003 | Jon M. Speigle | SLA1196 | 8924 |

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| EXAMINER |
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CHU, RANDOLPH I

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2624

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/728,573 | Applicant(s) SPEIGLE ET AL. | |
| | Examiner Randolph Chu | Art Unit 2624 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>2/2/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The

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disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

2. Claim 5 is objected to because of the following informalities: Claim 5 should terminated with period. Appropriate correction is required.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Reference numeral 2 and 4 described in paragraph [07] are not in Fig. 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 2, 3, 5-9, 11 and 12-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to claim 2, recite limitation "separating likely self-luminous image elements from likely reflective image elements" which was not described in the specification. In paragraph [0043]-[0045] of the specification disclose about self-luminous, but it does not disclose "separating likely self-luminous image elements from likely reflective image elements". One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 3, recite limitation "a binary value indicating that an element is reflective or self-luminous" which was not described in the specification. In paragraph [0043]-[0045] of the specification disclose an image contains a significant portion of self-luminous objects or reflective surface, but it does not disclose "a binary value indicating

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that an element is reflective or self-luminous". One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 5, recite limitation "separating self-luminous image elements comprises determining the proximity of an image element to image boundaries" which was not described in the specification. In paragraph [0043]-[0045] of the specification disclose about self-luminous, but it does not disclose "separating self-luminous image elements comprises determining the proximity of an image element to image boundaries". One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 6, recite limitation "separating self-luminous image elements comprises comparing the color characteristics of an image element to the color characteristics of reflective surfaces under a known illuminant" which was not described in the specification. In paragraph [0043]-[0045] of the specification disclose about self-luminous, but it does not disclose "separating self-luminous image elements comprises comparing the color characteristics of an image element to the color characteristics of reflective surfaces under a known illuminant". One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 7, recite limitation "separating self-luminous image elements comprises comparing the luminance characteristics of an image element to

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those of known self-luminous objects” which was not described in the specification. In paragraph [0043]-[0045] of the specification disclose about self-luminous, but it does not disclose “separating self-luminous image elements comprises comparing the luminance characteristics of an image element to those of known self-luminous objects”. One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 8, recite limitation “calculating an image chromaticity gamut is based solely on said reflective image elements” which was not described in the specification. In paragraph [0007] of the specification disclose “illuminant estimation employs a fixed set of known illuminants, which are each characterized by the gamut of chromaticities”, but it does not disclose “calculating an image chromaticity gamut is based solely on said reflective image elements”. One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 9, recite limitation “calculating an image chromaticity gamut is based on a weighted distribution of said reflective image elements and said self-luminous image elements wherein said reflective image elements have a greater influence on said gamut” which was not described in the specification. In paragraph [0043]-[0045] of the specification disclose about self-luminous, but it does not disclose “calculating an image chromaticity gamut is based on a weighted distribution of said reflective image elements and said self-luminous image elements wherein said

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reflective image elements have a greater influence on said gamut". One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 11, recite limitation "image elements that are more likely to be self-luminous have a lower weight than image elements that are more likely to be reflective elements" in 4th line, which was not described in the specification. In paragraph [0043]-[0045] of the specification disclose about self-luminous, but it does not disclose "image elements that are more likely to be self-luminous have a lower weight than image elements that are more likely to be reflective elements". One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 12, recite limitation "weight value related to the probability that an image element in an image corresponds to a reflective surface" in 6th line, which was not described in the specification. In paragraph [0043]-[0045] of the specification disclose about self-luminous / reflective, but it does not disclose "weight value related to the probability that an image element in an image corresponds to a reflective surface". One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

With respect to claim 12, recite limitation "establishing a color gamut histogram for said image wherein said weight value is used to increment the accumulator of a corresponding histogram bin" in 8th line, which was not described in the specification. In

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paragraph [0039]-[0057] of the specification disclose about histogram, but it does not disclose "establishing a color gamut histogram for said image wherein said weight value is used to increment the accumulator of a corresponding histogram bin". One in the ordinary skilled in the art would not been unduly burdened to make or use the claimed invention.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites the limitation "the accumulator" in 9th line. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claim 16 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 16 is all directed to a distributed software agent. "A set of executable instructions" refers to software, which is functional descriptive material, which per se is nonstatutory. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Finlayson et al. (Finlayson, G. D. Hordley, S. D., Hubel, P. M. "Color by correlation: a simple, unifying framework for color constancy," IEEE Trans. Pattern Analysis and Machine Intelligence, vol. 23, pp 1209-1221, 2001, cited by IDS).

With respect to claim 1, Finlayson et al. teaches, calculating color gamut models for a plurality of candidate illuminants (possible scene illuminants) (Fig. 1, Page 1212 and

1213); calculating an image color gamut (Fig. 1, Page 1212); determining a distance match metric (correlation value) for each of said candidate illuminants with reference to said image color gamut (Figs. 1 and 2, Pages 1212 and 1213); and selecting an image illuminant from said plurality of candidate illuminants based on said distance match metric (Page 1214, eq. 14-16).

With respect to claim 4, Finlayson et al. teaches, the gamuts for a plurality of candidate illuminants are histograms of color values for a set of color chips as rendered under each candidate illuminant (Fig 2).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2, 5-9, 11, 15 and 16 are rejected under 35 USC 103(a) as being unpatentable over Finlayson et al. (Finlayson, G. D. Hordley, S. D., Hubel, P. M. "Color by correlation: a simple, unifying framework for color constancy," IEEE Trans. Pattern Analysis and Machine Intelligence, vol. 23, pp 1209-1221, 2001, cited by IDS) in view of Kim et al. (US 6,249,601).

With respect to claim 2, Finlayson et al. teaches calculating color gamuts for a plurality of candidate illuminants (possible scene illuminants) (Fig. 1, Page 1212 and 1213); determining a match metric (correlation value) for each of the candidate illuminants (Figs. 1 and 2, Pages 1212 and 1213); and selecting an image illuminant from the plurality of candidate illuminants based on the match metric (Page 1214, eq. 14-16).

Finlayson et al. does not teach expressly that calculating a self-luminosity feature comprising a feature indicating the degree (threshold) to which image elements are similar to self-luminous image elements or reflective image elements; separating likely self-luminous image elements from likely reflective image elements; calculating an image color gamut wherein the reflective image elements are considered differently than the self-luminous image elements;

Kim et al. teaches calculating a self-luminosity feature comprising a feature indicating the degree (threshold) to which image elements are similar to self-luminous image elements or reflective image elements (col. 2 lines 25-53); separating likely self-luminous image elements from likely reflective image elements (col. 2 lines 25-39); calculating an image color gamut wherein the reflective image elements are considered differently than the self-luminous image elements (col. 2 lines 25-53).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to separate self-luminous image elements from reflective image elements in the method of Finlayson et al.

The suggestion/motivation for doing so would have been that To provide the color of an illuminant by which it is possible to extract stable and effective illuminant information by selectively excluding self luminous area from an image which human visually perceives.

Therefore, it would have been obvious to combine Kim et al. with Finlayson et al. to obtain the invention as specified in claim 2.

With respect to claim 5, Kim et al. teaches the separating self-luminous image elements comprises determining the proximity of an image element to image boundaries (col. 7 line 35 – col. 8 line 16).

With respect to claim 6, Kim et al. teaches separating self-luminous image elements comprises comparing the color characteristics of an image element to the color characteristics of reflective surfaces under a known illuminant (according to the human vision characteristic) (col. 7 lines 26 – 34).

With respect to claim 7, Kim et al. teaches the separating self-luminous image elements comprises comparing the luminance characteristics of an image element to those of known self-luminous objects (col. 7 lines 26 – 34).

With respect to claim 8, Kim et al. teaches calculating an image chromaticity gamut is based solely on said reflective image elements (col. 8 lines 17-30)

With respect to claim 9, Kim et al. teaches calculating an image chromaticity gamut is based on a weighted distribution of said reflective image elements and said self-luminous image elements wherein said reflective image elements have a greater influence on said gamut (col. 7 line17 – col. 8 line 16).

With respect to claim 11, Finlayson et al. teaches calculating color gamuts for a plurality of candidate illuminants (possible scene illuminants) (Fig. 1, Page 1212 and 1213); determining a match metric for matching a color gamut histogram for each of the candidate illuminants to a color gamut histogram for the image elements (Figs. 1 and 2, Pages 1212 and 1213); and selecting an image illuminant from the plurality of candidate illuminants based on the match metric (Page 1214, eq. 14-16).

Finlayson et al. does not teach expressly that identifying image elements according to their likelihood of being self-luminous; calculating an image color gamut from the image elements wherein the image elements that are more likely to be self-luminous have a lower weight than image elements that are more likely to be reflective elements.

Kim et al. teaches identifying image elements according to their likelihood of being self-luminous (col. 2 lines 25-53); calculating an image color gamut from the image elements wherein the image elements that are more likely to be self-luminous have a lower weight than image elements that are more likely to be reflective elements (col. 7 line17 – col. 8 line 16).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to separate self-luminous image elements from reflective image elements in the method of Finlayson et al.

The suggestion/motivation for doing so would have been that To provide the color of an illuminant by which it is possible to extract stable and effective illuminant information by selectively excluding self luminous area from an image which human visually perceives.

Therefore, it would have been obvious to combine Kim et al. with Finlayson et al. to obtain the invention as specified in claim 11.

With respect to claim 15, please refer to rejection for claim 2.

With respect to claim 16, please refer to rejection for claim 2.

12. Claim 10 is rejected under 35 USC 103(a) as being unpatentable over Finlayson et al. (Finlayson, G. D. Hordley, S. D., Hubel, P. M. "Color by correlation: a simple, unifying framework for color constancy," IEEE Trans. Pattern Analysis and Machine Intelligence, vol. 23, pp 1209-1221, 2001, cited by IDS) in view of Nichogi et al. (US 2003/0021472).

Finlayson et al. discloses all the limitations of claim 1 as applied above from which claim 10 respectively depend.

Finlayson et al. does not teach expressly that determining a match metric comprises calculating a chi-squared statistic related to the variance.

Nichogi et al. teaches determining a match metric comprises calculating a chi-squared statistic related to the variance (para [0062]-[0071]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to determine a match metric by calculating chi-squared statistic in the method of Finlayson et al.

The suggestion/motivation for doing so would have been that to fix a range if a color to be expressed in the same base group.

Therefore, it would have been obvious to combine Nichogi et al. with Finlayson et al. to obtain the invention as specified in claim 10.

13. Claims 12 and 13 are rejected under 35 USC 103(a) as being unpatentable over Finlayson et al. (Finlayson, G. D. Hordley, S. D., Hubel, P. M. "Color by correlation: a simple, unifying framework for color constancy," IEEE Trans. Pattern Analysis and Machine Intelligence, vol. 23, pp 1209-1221, 2001, cited by IDS) in view of Kim et al. (US 6,249,601) and Brainard et al. (David H. Brainard, William T. Freeman, "Bayesian color constancy", Vol. 14 No. 7 / July 1997 / Journal of Optical Society of America, Pages 1393-1411).

With respect to claim 12, Finlayson et al. teaches computing a match metric between the image color gamut histogram and at least one the illuminant histograms (Figs. 1 and 2, Pages 1212 and 1213); and selecting an estimated image illuminant

from among the set of illuminants wherein the estimated image illuminant has the closest match to the image color gamut histogram (Fig. 2, Page 1214, eq. 14-16).

Finlayson et al. does not teach expressly that selecting a set of known illuminants; estimating a weight value related to the probability that an image element in an image corresponds to a reflective surface; establishing a color gamut for each of the known illuminants wherein the gamuts are represented by sample distribution histograms of color values for a set of color chips as rendered under each of the known illuminants; establishing a color gamut histogram for the image wherein the weight value is used to increment the accumulator of a corresponding histogram bin;

Kim et al. teaches selecting a set of known illuminants (standard illuminants) (col. 8 lines 36-48); estimating a weight value related to the probability that an image element in an image corresponds to a reflective surface (col. 7 line17 – col. 8 line 16);

Brainard et al. teaches establishing a color gamut for each of the known illuminants wherein the gamuts are represented by sample distribution histograms of color values for a set of color chips as rendered under each of the known illuminants (Page 1398 – 1399, 3 Bayesian color consistency, Fig. 4); establishing a color gamut histogram for the image wherein the weight value is used to increment the accumulator of a corresponding histogram bin (Page 1398 – 1399, 3 Bayesian color consistency, Fig. 4);

At the time of the invention it would have been obvious to a person of ordinary skill in the art to estimate image illuminant by known illuminants in the method of Finlayson et al.

The suggestion/motivation for doing so would have been that To provide the color of an illuminant by which it is possible to extract stable and effective illuminant information by selectively excluding self luminous area from an image which human visually perceives.

Therefore, it would have been obvious to combine Kim et al. and Brainard et al. with Finlayson et al. to obtain the invention as specified in claim 12.

With respect to claim 13, Brainard et al. teaches estimating a weight value comprises using a function comprising element color values and two image position values (Page 1398, right column).

14. Claim 14 is rejected under 35 USC 103(a) as being unpatentable over Finlayson et al. (Finlayson, G. D. Hordley, S. D., Hubel, P. M. "Color by correlation: a simple, unifying framework for color constancy," IEEE Trans. Pattern Analysis and Machine Intelligence, vol. 23, pp 1209-1221, 2001, cited by IDS) in view of Kim et al. (US 6,249,601) and Brainard et al. (David H. Brainard, William T. Freeman, "Bayesian color constancy", Vol. 14 No. 7 / July 1997 / Journal of Optical Society of America, Pages 1393-1411) and in further view of Nichogi et al. (US 2003/0021472).

Finlayson et al. discloses all the limitations of claim 12 as applied above from which claim 14 respectively depend.

Finlayson et al. does not teach expressly that determining a match metric comprises calculating a chi-squared statistic related to the variance.

Nichogi et al. teaches determining a match metric comprises calculating a chi-squared statistic related to the variance (para [0062]-[0071]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to determine a match metric by calculating chi-squared statistic in the method of Finlayson et al.

The suggestion/motivation for doing so would have been that to fix a range if a color to be expressed in the same base group.

Therefore, it would have been obvious to combine Nichogi et al. with Kim et al. Brainard et al. and Finlayson et al. to obtain the invention as specified in claim 14.

Conclusion

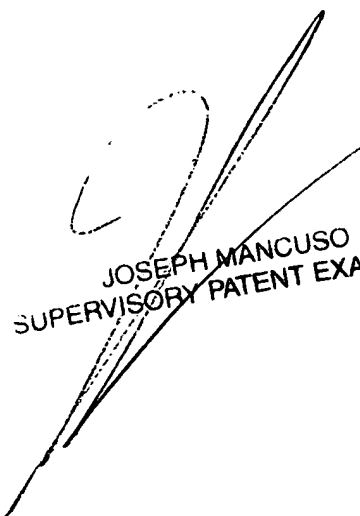
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randolph Chu whose telephone number is 571-270-1145. The examiner can normally be reached on Monday to Thursday from 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RIC/



JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER